FIG. 1 (PRIOR ART)

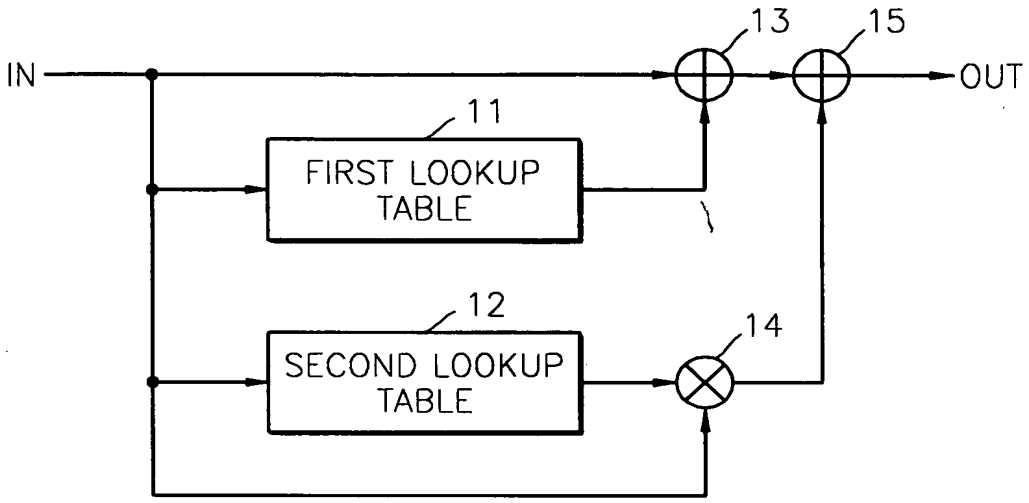


FIG. 2 (PRIOR ART)

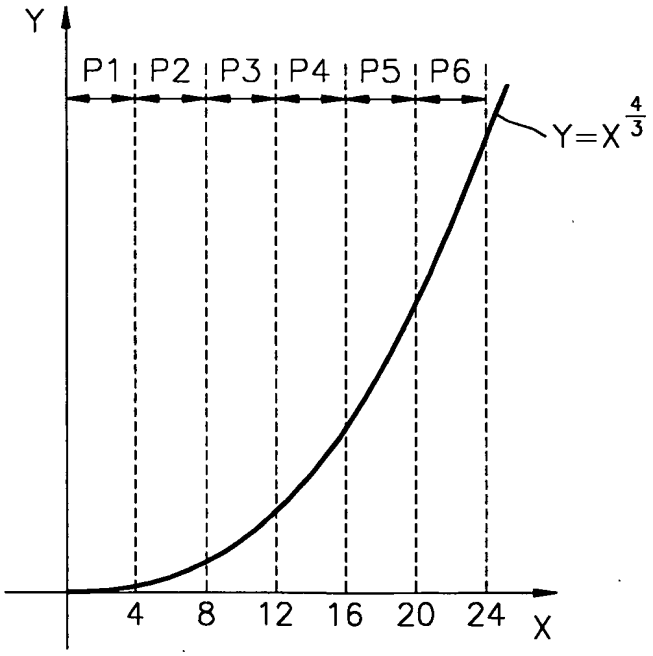


FIG. 3

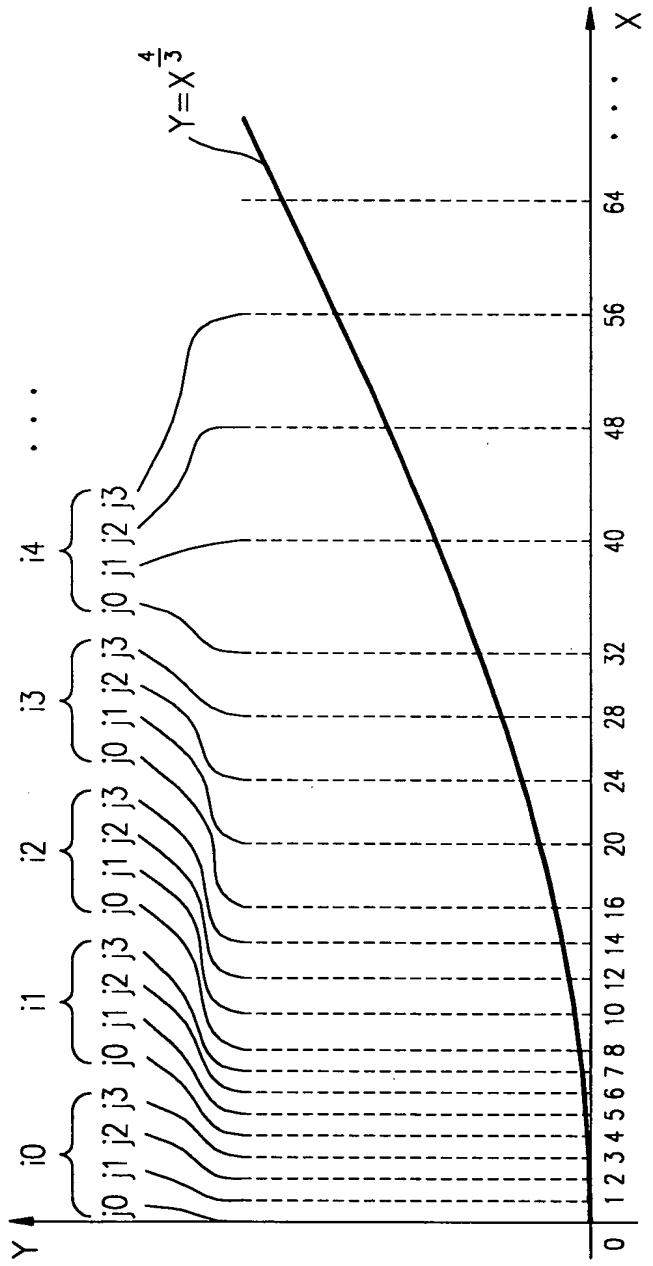

Y
X
i0
i1
i2
i3
i4
j0 j1 j2 j3
0 1 2 3 4 5 6 7 8 10 12 14 16 20 24 28 32 40 48 56 64 . . .
$Y=X^{\frac{4}{3}}$

FIG. 4

41

SECTION(i)		STEP (j)	X-COORDINATE VALUE		Y-COORDINATE VALUE	ADDRESS
SECTION ORDER (iO)	SECTION NUMBER (iN)		BINARY NUMBER	DECIMAL NUMBER		
i0	0	0	0000000 A	0	0.00000	0
		1	0000001	1	0.00001	1
		2	0000010	2	0.00002	2
		3	0000011	3	0.00003	3
i1	0	0	0000100 A	4	0.00004	4
		1	0000101	5	0.00005	5
		2	0000110	6	0.00007	6
		3	0000111	7	0.00008	7
i2	1	0	0001000 A	8	0.00010	8
		1	0001010	10	0.00013	9
		2	0001100	12	0.00017	10
		3	0001110	14	0.00020	11
i3	2	0	0010000 A	16	0.00024	12
		1	0010100	20	0.00033	13
		2	0011000	24	0.00042	14
		3	0011100	28	0.00052	15
i4	3	0	0100000 A	32	0.00062	16
		1	0101000	40	0.00083	17
		2	0110000	48	0.00106	18
		3	0111000	56	0.00130	19

FIG. 5

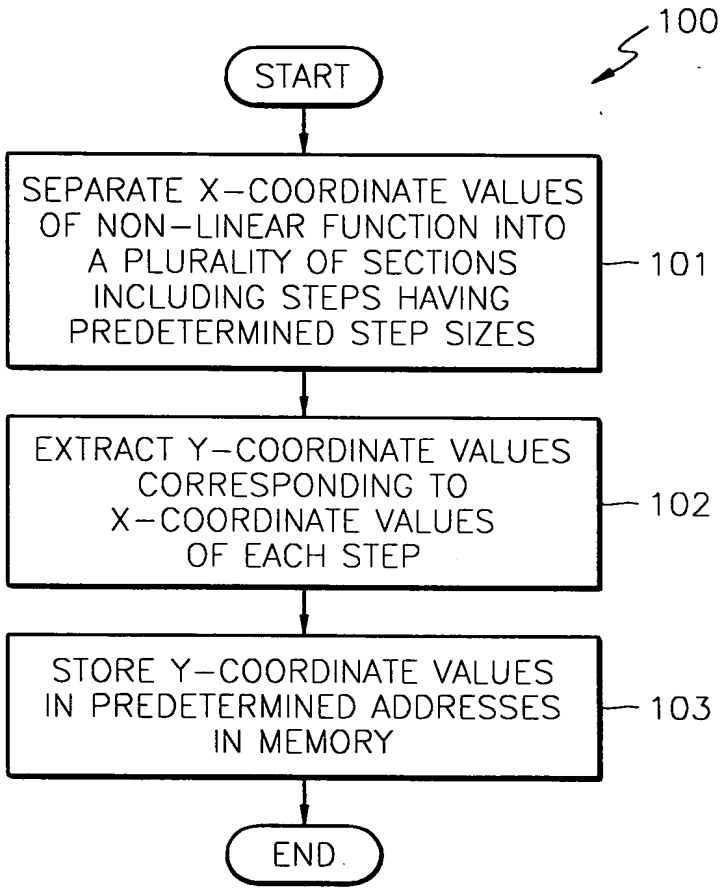

100
START
SEPARATE X-COORDINATE VALUES OF NON-LINEAR FUNCTION INTO A PLURALITY OF SECTIONS INCLUDING STEPS HAVING PREDETERMINED STEP SIZES
101
EXTRACT Y-COORDINATE VALUES CORRESPONDING TO X-COORDINATE VALUES OF EACH STEP
102
STORE Y-COORDINATE VALUES IN PREDETERMINED ADDRESSES IN MEMORY
103
END

FIG. 6

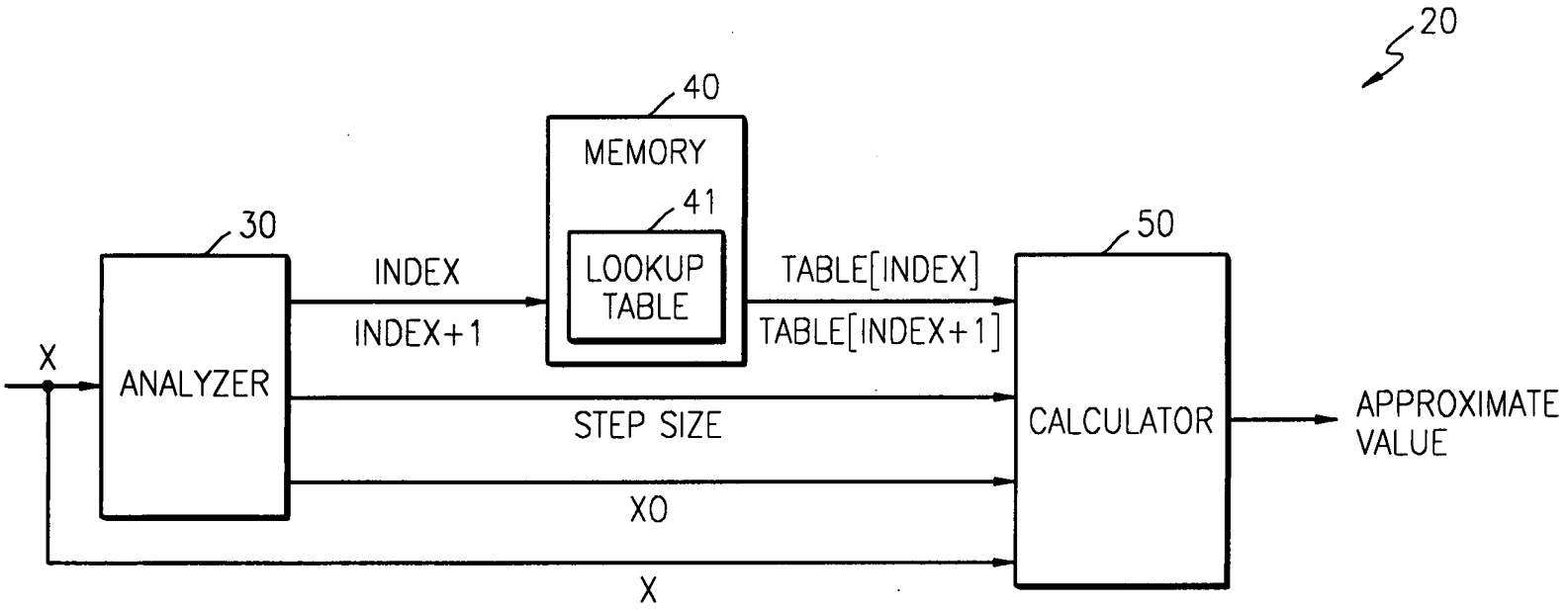

20
40
MEMORY
41
LOOKUP TABLE
30
ANALYZER
50
CALCULATOR
X
INDEX
INDEX+1
TABLE[INDEX]
TABLE[INDEX+1]
STEP SIZE
XO
X
APPROXIMATE VALUE

FIG. 7

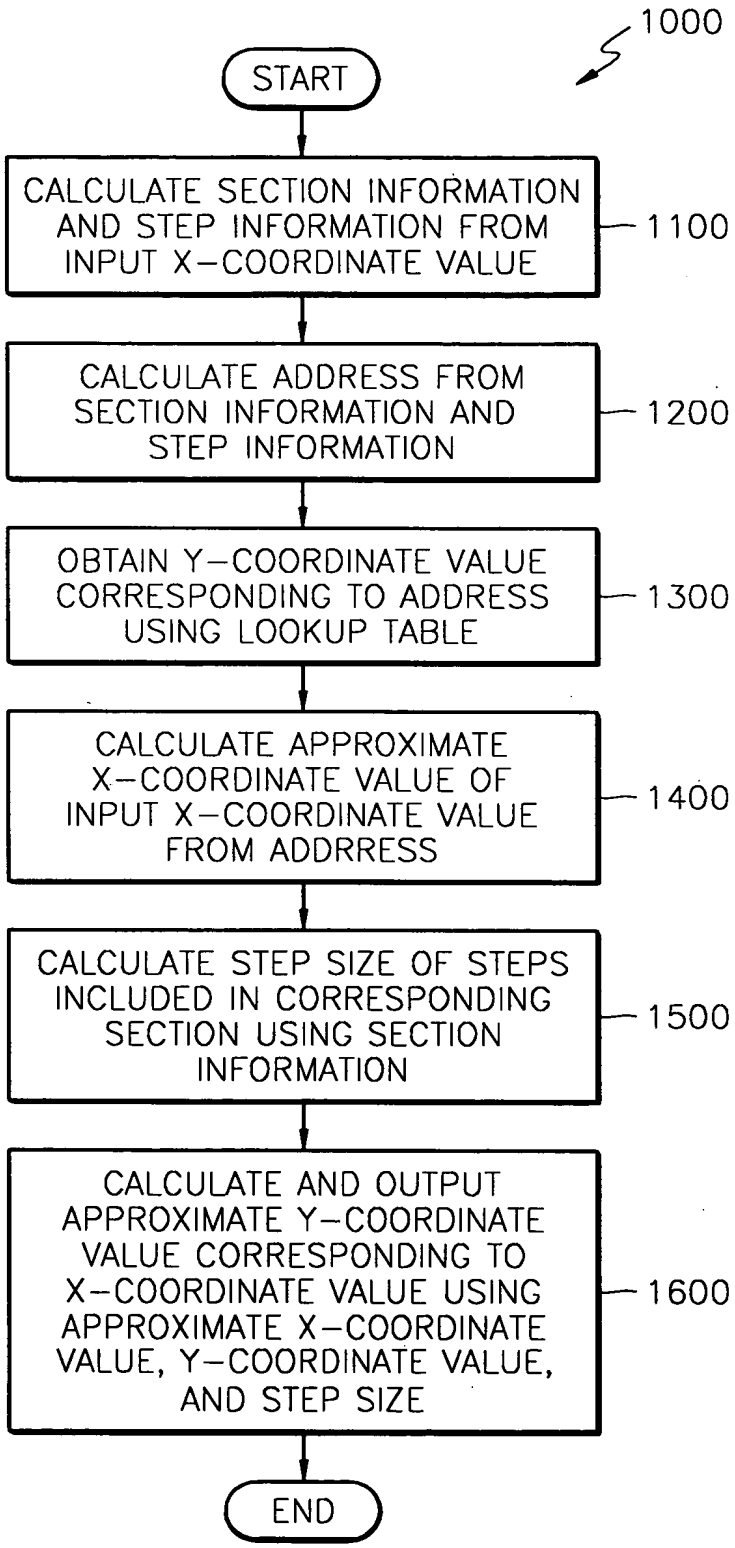

1000
START
CALCULATE SECTION INFORMATION AND STEP INFORMATION FROM INPUT X-COORDINATE VALUE
1100
CALCULATE ADDRESS FROM SECTION INFORMATION AND STEP INFORMATION
1200
OBTAIN Y-COORDINATE VALUE CORRESPONDING TO ADDRESS USING LOOKUP TABLE
1300
CALCULATE APPROXIMATE X-COORDINATE VALUE OF INPUT X-COORDINATE VALUE FROM ADDRRESS
1400
CALCULATE STEP SIZE OF STEPS INCLUDED IN CORRESPONDING SECTION USING SECTION INFORMATION
1500
CALCULATE AND OUTPUT APPROXIMATE Y-COORDINATE VALUE CORRESPONDING TO X-COORDINATE VALUE USING APPROXIMATE X-COORDINATE VALUE, Y-COORDINATE VALUE, AND STEP SIZE
1600
END

FIG. 8

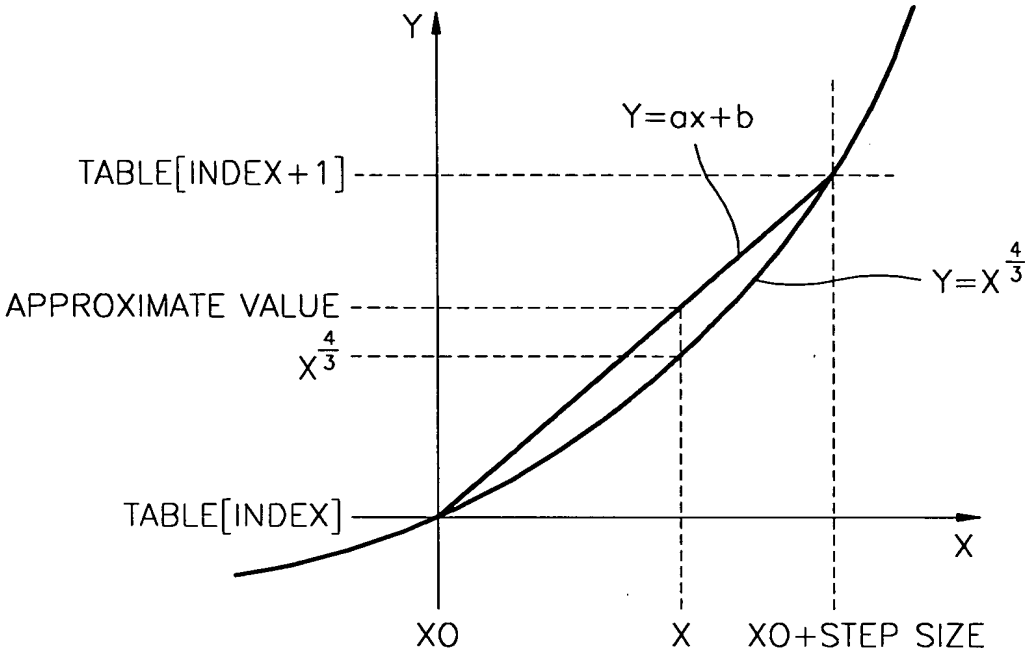

Y
Y=ax+b
TABLE[INDEX+1]
Y=X^4/3
APPROXIMATE VALUE
X^4/3
TABLE[INDEX]
X
XO
X
XO+STEP SIZE

FIG. 9

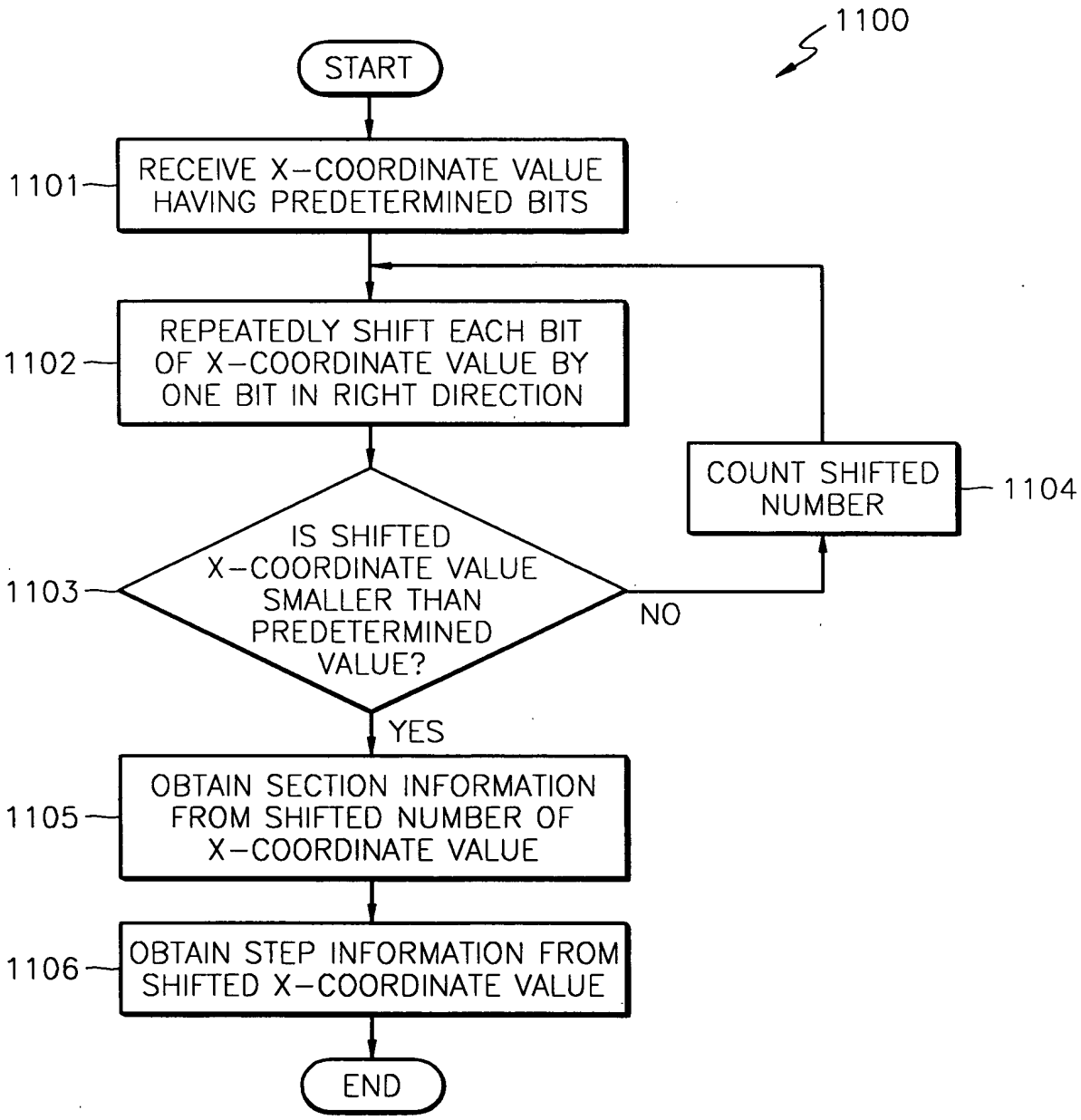
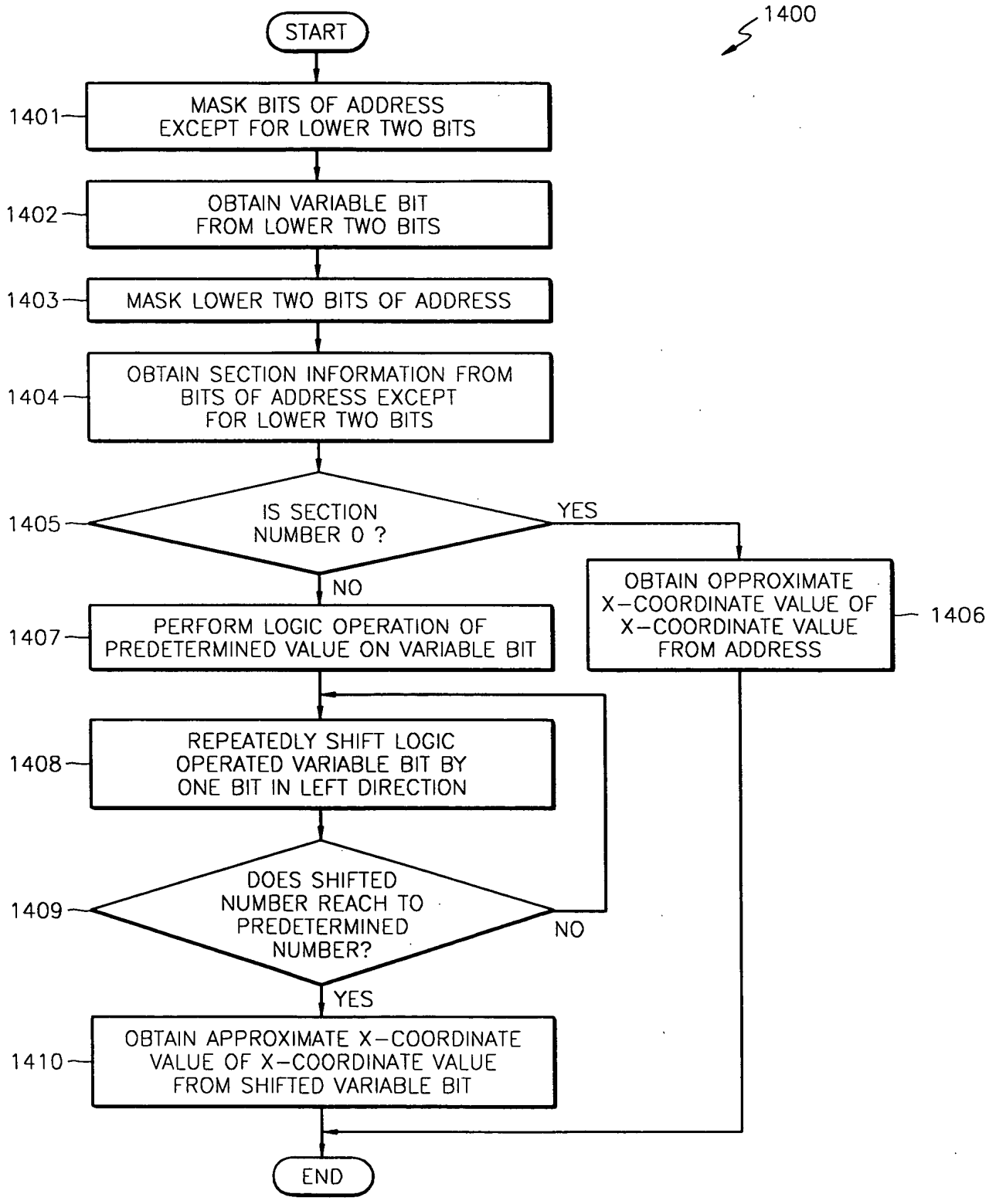

1100
START
1101
RECEIVE X-COORDINATE VALUE HAVING PREDETERMINED BITS
1102
REPEATEDLY SHIFT EACH BIT OF X-COORDINATE VALUE BY ONE BIT IN RIGHT DIRECTION
1103
IS SHIFTED X-COORDINATE VALUE SMALLER THAN PREDETERMINED VALUE?
NO
1104
COUNT SHIFTED NUMBER
YES
1105
OBTAIN SECTION INFORMATION FROM SHIFTED NUMBER OF X-COORDINATE VALUE
1106
OBTAIN STEP INFORMATION FROM SHIFTED X-COORDINATE VALUE
END

FIG. 10


1400
START
1401
MASK BITS OF ADDRESS EXCEPT FOR LOWER TWO BITS
1402
OBTAIN VARIABLE BIT FROM LOWER TWO BITS
1403
MASK LOWER TWO BITS OF ADDRESS
1404
OBTAIN SECTION INFORMATION FROM BITS OF ADDRESS EXCEPT FOR LOWER TWO BITS
1405
IS SECTION NUMBER 0 ?
YES
NO
1406
OBTAIN OPPROXIMATE X-COORDINATE VALUE OF X-COORDINATE VALUE FROM ADDRESS
1407
PERFORM LOGIC OPERATION OF PREDETERMINED VALUE ON VARIABLE BIT
1408
REPEATEDLY SHIFT LOGIC OPERATED VARIABLE BIT BY ONE BIT IN LEFT DIRECTION
1409
DOES SHIFTED NUMBER REACH TO PREDETERMINED NUMBER?
NO
YES
1410
OBTAIN APPROXIMATE X-COORDINATE VALUE OF X-COORDINATE VALUE FROM SHIFTED VARIABLE BIT
END